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1200 19TH STREET, N.W.

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TOKYO, JAPAN

SUITE 500

WASHINGTON, D.C. 20036

(202) 955-9600

FACSIMILE

(202) 955-9792

DIRECT LINE (202) 955-9888

E-MAIL jheitmann@kelleydrye.com

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

September 3, 1999

VIA HAND DELIVERY

Magalie R. Salas, Secretary
Federal Communications Commission
445 12th Street. S.W.
Washington, D.C. 20554

> Re: **Notice of *Ex Parte* Presentations by e.spire Communications, Inc. and Intermedia Communications Inc.**
>
> ***Implementation of the Local Competition Provisions in the Telecommunications Act of 1996* -- CC Docket No. 96-98**

Dear Ms. Salas:

Pursuant to Sections 1.1206(b)(1) and (2) of the Commission's Rules, e.spire Communications, Inc. ("e.spire") and Intermedia Communications Inc. ("Intermedia"), by their attorneys, submit this notice of an oral *ex parte* presentation made, and written *ex parte* materials distributed, on September 2, 1999, in the above-captioned docketed proceeding. The *ex parte* presentations were made during a debate on advanced services UNEs sponsored by Commissioner Ness and Linda Kinney of Commissioner Ness's Office. Representing e.spire during the debate and making a presentation on its behalf were Charles Kallenbach, Vice President, Legal and Regulatory, of e.spire and Jon Canis of Kelley Drye & Warren LLP. Representing Intermedia during the debate and making a presentation on its behalf were Heather Gold, Vice President, Regulatory and External Affairs and Julia Strow, Assistant Vice President, Industry Policy, both of Intermedia. Copies of the written materials distributed at the debate are attached hereto.

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During the debate, e.spire and Intermedia discussed positions set forth in its comments, reply comments and *ex parte* presentations filed in the UNE Remand phase of the above-captioned proceeding. In particular, e.spire and Intermedia focused on the need for a virtual circuit UNE (applicable to frame relay and other packetized services).

Pursuant to Sections 1.1206(b)(1) and (2), an original and two copies of this *ex parte* notification (with attachments) are provided for inclusion in the public record of the above-referenced proceeding. Please direct any questions regarding this matter to the undersigned.

Respectfully submitted,

John J. Heitmann

cc: Commissioner Ness
        Linda Kinney, Office of Commissioner Ness
        International Transcription Services

e.spire / Intermedia
Frame Relay and Data UNEs

Position Paper

- Technical overview of frame relay technology and service.

  - Physical components of frame relay service.
  - How a frame relay transmission gets from point A to B – and how fast.
  - Frame relay in terms of the OSI protocol stack.

- Why current arrangements with ILECs are stalling competition and limiting consumer choice in data service providers.

- Specific unbundling proposals: a PVC UNE or specific frame relay UNEs in combination (corresponding to tariffed elements of ILEC frame relay service).

- Frame relay / data UNEs satisfy the "impair" standard.

Diagrams

A Frame relay frame
B Getting to the first frame relay switch
C Frame relay – physical components
D PVCs and ILEC tariffed elements
E Frame relay on the OSI protocol stack
F Connecting frame relay networks to expand the reach of ILEC and CLEC networks
G Frame relay interconnection
H How to get a frame relay customer onto a CLEC's frame relay network
I Different delivery options lead to different pricing scenarios

Appendix

- e.spire frame relay interconnection and UNE arbitration decisions from Arizona, Colorado and New Mexico.

- Frame relay service excerpts from RBOC/GTE FCC access tariffs.

The FCC must extend its implementation of the local competition provisions of the 1996 Act into the packet-switched world.

- The FCC has determined that the Act is technology neutral.

- ILECs are not "new entrants" into packet-switched data transmission markets.

  - ILECs deployed frame relay and other data technologies before the 1996 Act.

  - ILECs have continued to deploy new technologies, even though faced with potential unbundling obligations.

  - By generating additional demand and providing a reasonable profit, unbundling actually encourages ILEC deployment of advanced technologies.

- The ILECs' ubiquitous loop and transport network, enormous embedded customer base, and resulting economies of scale give them distinct and decisive advantages that extend beyond the circuit-switched world.

2

Frame relay is a packet-based technology that provides a very efficient and reliable means of transporting high-speed, high volume, bursty data between geographically dispersed LANs.

- Frames are like programmable and extendable data boxcars – neither segmentation into standard-sized packets nor protocol conversions are required.

- Physical components of frame relay service include:

  - Customer premise equipment (at both ends of a transmission) known as a Frame Relay Access Device or Frame Relay Assembler/Disassembler (**FRAD**).

  - A loop, extended link or special access circuit known as a Frame Relay Access Link (**FRAL**).

  - Multiplexing equipment known as a Digital Access and Cross-Connect System (**DACS**) used to aggregate DS-0 traffic onto a common T-1 (or DS-1 traffic onto a T-3) headed for a frame relay switch. (~$65,000)

  - A frame relay switch, including User-to-Network Interface Ports (**UNI Port**) and Network-to-Network Interface Ports (**NNI Port**). (~$250,000)

  - DS-3 and OCn transport links.

- Getting from point A to point B is accomplished by assigning Data Link Connection Identifiers (**DLCI**) to each "hop" between two pieces of frame relay equipment (CPE and switches).

  - A string of DLCIs constitute a Permanent Virtual Circuit (**PVC**).

- How fast a transmission travels across the frame relay network is determined by network capacity and engineering. Frame relay service is sold at minimum guaranteed speeds or Committed Information Rates (**CIR**).

3

Frame relay providers realize cost-efficiencies through the network engineering practice of "oversubscription".

- The shared nature and integrated switching/transport fabric of frame relay networks allows for the assignment of multiple DLCIs to the same transmission link.

- To achieve maximum use of frame relay switching capacity and transport links, DLCIs at varying CIRs generally are assigned to switch/transport links so that the aggregate CIR or capacity commitment is equal to 200% of the capacity of the switch port and transport link.

- Oversubscription factors may be adjusted if unacceptable peak-hour congestion is experienced.

- The practice of oversubscription yields a lower TELRIC for packetized transmission versus shared or dedicated circuit-switched transport over standard high capacity transport links.

4

e.spire and Intermedia seek access to frame relay and data UNEs in order to fill-out their own advanced frame relay and ATM networks.

- e.spire has deployed 66 data switches nationwide and Intermedia has deployed 175, giving it coverage in most LATAs.

- Frame relay UNEs are essential to CLECs' ability to compete for contracts to provide frame relay services to customers with geographically dispersed LANs.

- e.spire and Intermedia will use frame relay UNEs to provide connectivity between outlying customer LAN locations and their own frame relay switching/transport fabric.

- e.spire and Intermedia will combine frame relay UNEs with their own frame relay network elements to provide a finished service to an end user.

- Although the Arizona Corporation Commission has determined that U S West must make frame relay interconnection and UNEs available to e.spire at TELRIC, frame relay UNEs remain unavailable there and generally are not offered by ILECs anywhere.

- State commission confusion over intra and interLATA jurisdictional issues has left frame relay interconnection a muddled mess. e.spire and Intermedia use a mix of "NNI Agreements" and services ordered out of FCC access tariffs to achieve interconnection so that they can deliver intraLATA and interLATA frame relay traffic to customers on the ILECs' frame relay networks.

  - e.spire and Intermedia provide both intraLATA and interLATA frame relay services – they do not seek interconnection or access to UNEs exclusively to provide exchange access.

5

The Commission should require ILECs to provide unbundled access at TELRIC-based prices to a PVC UNE or to frame relay UNEs based on the ILECs' tariffed elements for frame relay service.

- Specific frame relay unbundling requirements should include:

    - Frame Relay Access Links (FRALs) – 2- or 4-wire loops in 56 kbps increments or extended links (including DACS multiplexing).

    - Frame Relay Transmission Fabric (integrated switching and DS-3/OCn transport links).

        - Corresponding ILEC tariffed elements for the integrated frame relay switching/transport fabric include:

            - User-to-Network Interface Ports (UNI Ports);

            - Network-to-Network Interface Ports (NNI Ports); and

            - Data Link Connection Identifiers at Committed Information Rates (DLCIs at CIRs).

- Because frame relay UNEs must be offered in combination to be useful, e.spire and Intermedia propose a single PVC UNE encompassing each of the ILECs' tariffed frame relay elements (FRAL, UNI and NNI Ports, DLCI@CIR).

    - A PVC UNE likely would transcend specific packet-based technologies and, thus, would be technology neutral and more broadly applicable than specific frame relay UNEs.

- The FCC should reaffirm that all UNEs, including frame relay and data UNEs, must be priced at TELRIC.

- The FCC should continue to prohibit ILEC- or state commission-imposed restrictions on the use of UNEs.

6

Cost and time-to-market factors indicate that frame relay UNEs satisfy the "impair" test of Section 251(d)(2). Without unbundled access to frame relay UNEs, e.spire and Intermedia's ability to compete is diminished materially.

- **Network proximity to each of a customer's geographically dispersed LAN locations often translates into a decisive cost-advantage for the ILECs.**

  - The ILECs' ubiquitous customer access, combined with ubiquitously deployed end office, loop and transport facilities, has enabled them to deploy more frame relay switches closer to frame relay customers.

  - While ILECs often are able to take advantage of the cost-efficiencies of a packet-switched network deployed at all customer LAN locations, CLECs that have not extended their frame relay networks to a particular business center must depend on special access, traditional UNEs and collocation, or (if available) extended links to connect a LAN in that business center to its frame relay network and other LANs in another business center.

    - If CLECs are to compete effectively, their costs for packetized transport products must reflect the efficiencies realized by oversubscription.

    - Costs of connecting each LAN, including those on- and off-net, must be factored into competitive bids. If off-net costs are not based on TELRIC that reflects the practice of oversubscription, CLECs may not be able to compete effectively for frame relay customers with geographically dispersed LANs.

  - Resale, even if available at an avoided cost discount, and special access priced in excess of TELRIC do not provide cost-effective alternatives to UNEs.

7

Impair test (continued) . . .

- **Packet-switched UNEs can provide cost effective alternatives in cases where:**

  - Geographic market characteristics cannot yet justify self-provisioning (~$250,000 for the switch, plus the costs of end office space, installation and collocation (~$50,000));

    - As is the case with traditional UNEs, frame relay/data UNEs can be used as stepping stones toward self-provisioning.

  - Special access incorporates an expensive distance-sensitive transport component;

    - Special access can be an alternative, if prices are set at a TELRIC that reflects the efficiencies of packetized transport.

  - Traditional UNEs require collocation (in addition to a distance-sensitive transport component priced at circuit-switched TELRIC, the expense (~$50,000) and delay (several months to more than a year) of collocation may make a competitive bid impossible);

  - If available, an extended link UNE or combination includes a long transport component priced at circuit-switched TELRIC.
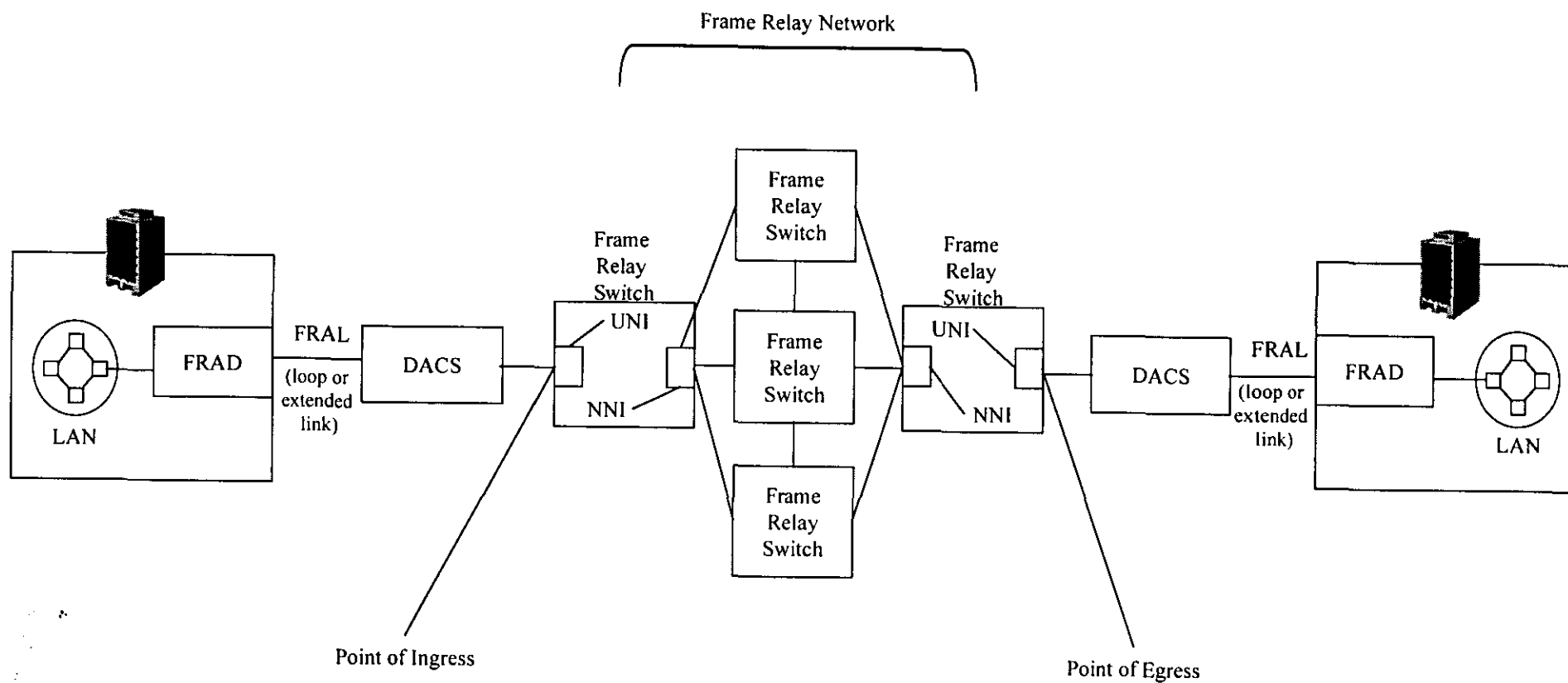
8

Impair test (continued)...

- **Time-to-market: how long of a delay is too long?**

    - In order to compete effectively, a CLEC must be able to offer a competitive bid in roughly the same time and a provisioning interval of roughly the same length as an ILEC.

    - Self-provisioning will engender a delay substantially longer than that involved with use of a PVC UNE or other frame relay UNE combinations (determining the permissibility of combinations may involve additional delay).

    - Without a PVC UNE or frame relay UNE combinations, CLECs may not be able to demonstrate or accumulate sufficient demand to justify the costs of collocation and switch deployment – time-to-market delays could be unpredictable or interminable, either of which would prevent a competitive bid.

    - Delays associated with collocation (from months to more than a year) and additional frame relay switch deployment generally are not experienced by the ILECs.

    - Unless self-provisioning or wholesale alternatives to UNEs are available in a timeframe similar to that which the ILEC itself would need to provision the service, delay-to-market differentials compel unbundling.

9

Impair test (continued) . . .

- **The FCC's Section 706 mandate and the public interest also compel definition of frame relay/data UNEs.**

  - While frame relay UNEs may not accelerate the pace of competition in rural America, their impact on the small businesses driving today's Internet boom and economic expansion could be dramatic.

  - By generating additional demand and providing a reasonable profit, unbundling actually encourages ILEC deployment of advanced technologies.

  - As in the voice world, frame relay UNEs will extend the reach of competitive facilities-based networks and, thereby, will promote and maximize additional facilities deployment by competitors.

  - Extended reach means more choices for consumers.

  - Extending competitors' reach also will place pressure on ILECs to improve their frame relay service offerings and to move prices down toward cost.

10

Frame Relay - Physical Components

Frame Relay Network

Frame Relay Switch
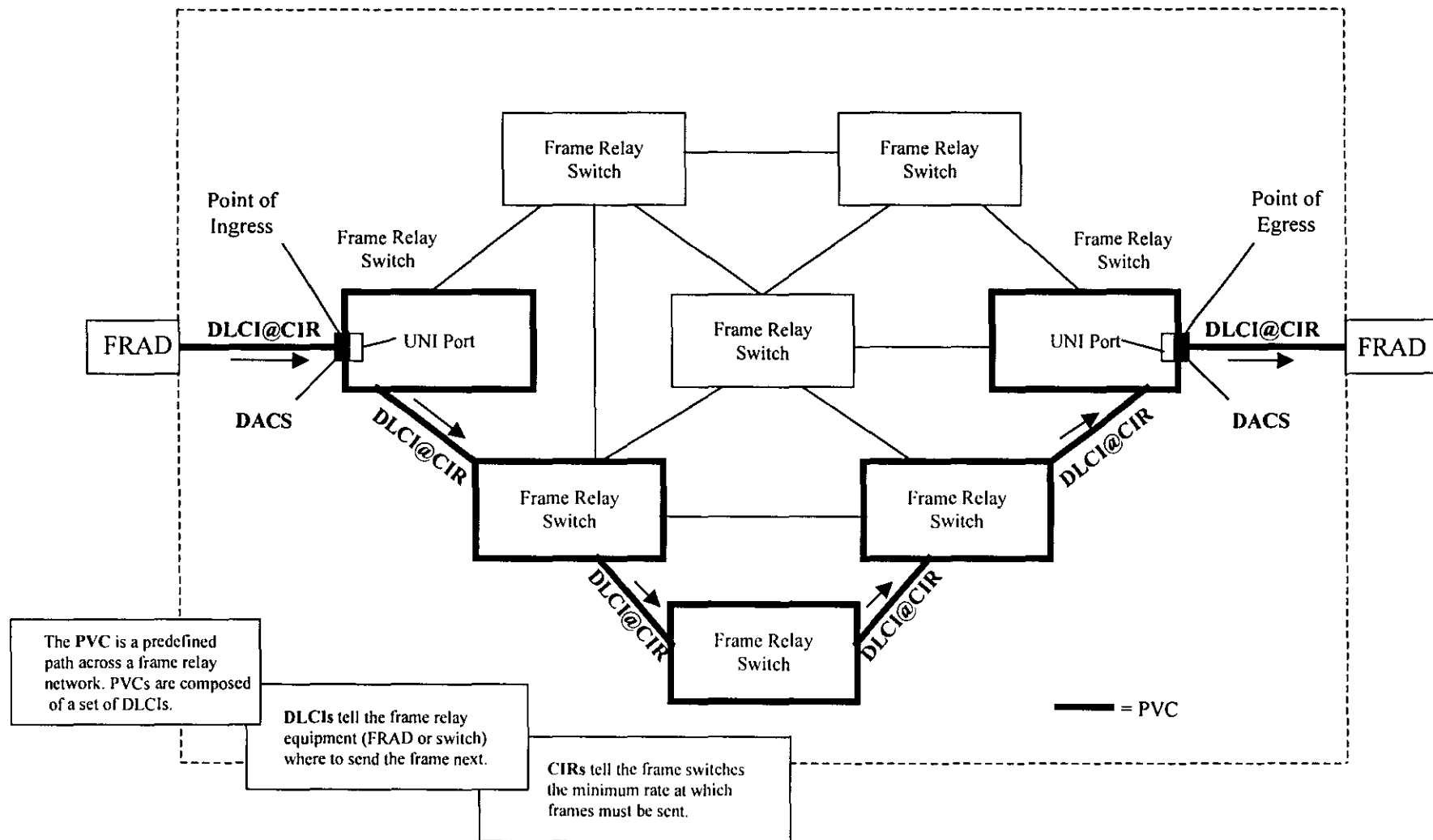
Frame Relay Switch

Frame Relay Switch

Frame Relay Switch

Frame Relay Switch

UNI

NNI

UNI

NNI

LAN

FRAD

FRAL
(loop or
extended
link)

DACS

DACS

FRAL
(loop or
extended
link)

FRAD

LAN

Point of Ingress

Point of Egress

Diagram C

Frame Relay - PVCs and ILEC Tariff Elements

Frame Relay Switch

Frame Relay Switch

Point of Ingress

Point of Egress

Frame Relay Switch

Frame Relay Switch

FRAD

DLCI@CIR

UNI Port

Frame Relay Switch

UNI Port

DLCI@CIR

FRAD

DACS

DLCI@CIR

DACS

DLCI@CIR

Frame Relay Switch

Frame Relay Switch

DLCI@CIR

DLCI@CIR

Frame Relay Switch

The **PVC** is a predefined path across a frame relay network. PVCs are composed of a set of DLCIs.

DLCIs tell the frame relay equipment (FRAD or switch) where to send the frame next.

CIRs tell the frame switches the minimum rate at which frames must be sent.

━━━ = PVC

Diagram D

Frame Relay on the OSI Protocol Stack

7 **Application Layer**

6 **Presentation Layer**

5 **Session Layer**

4 **Transport Layer**

3 **Network Layer**   FRAD assembles frames.

Frame
Relay
Operates
Here

2 **Data-Link Layer**   PVCs and DLCIs determine
frame path.

1 **Physical Layer**   Frames are transported over and
switched by FRADs, FRALs
and switches.
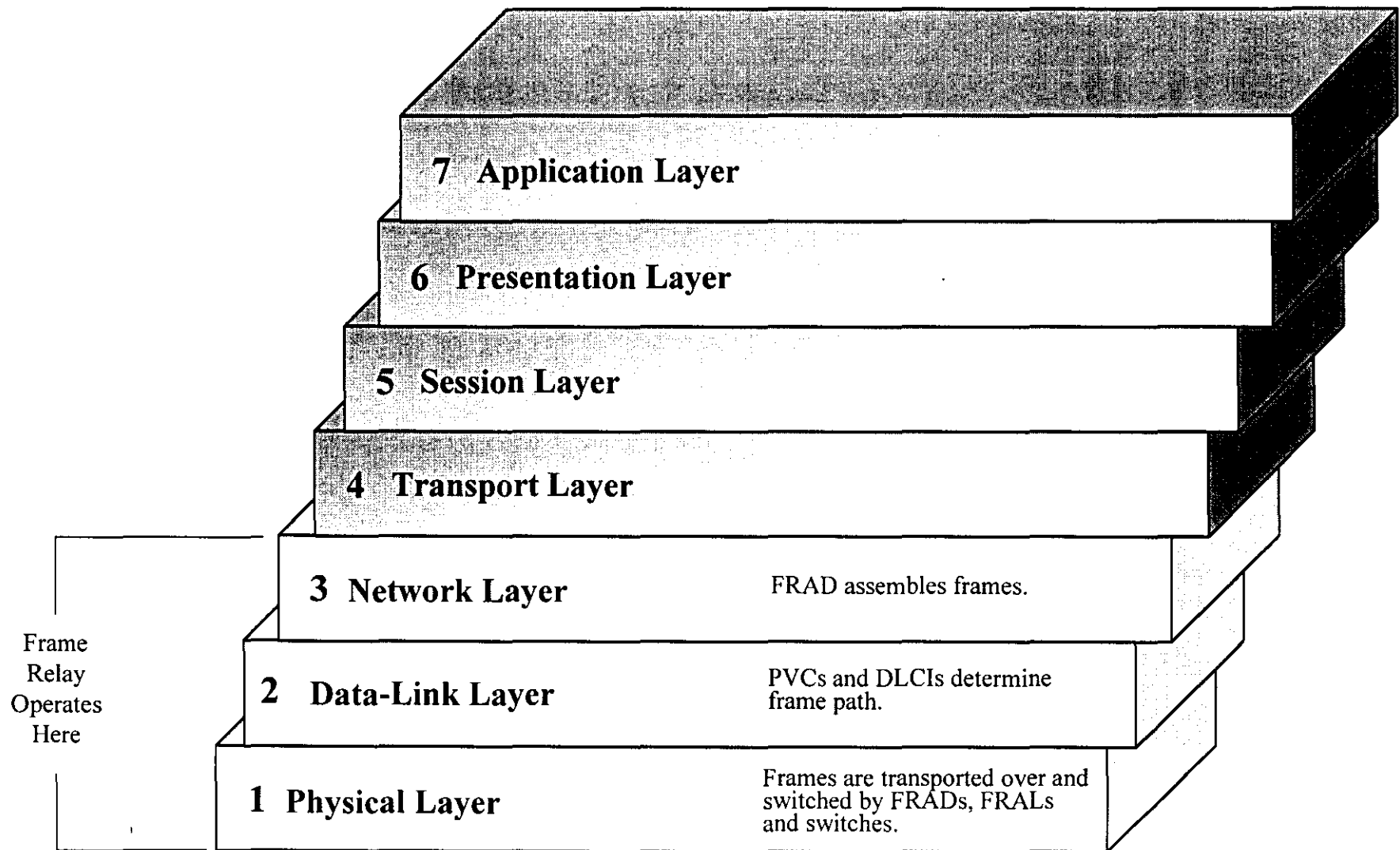
Diagram E

Connecting Frame Relay Networks to Expand the Reach of ILEC and CLEC Networks
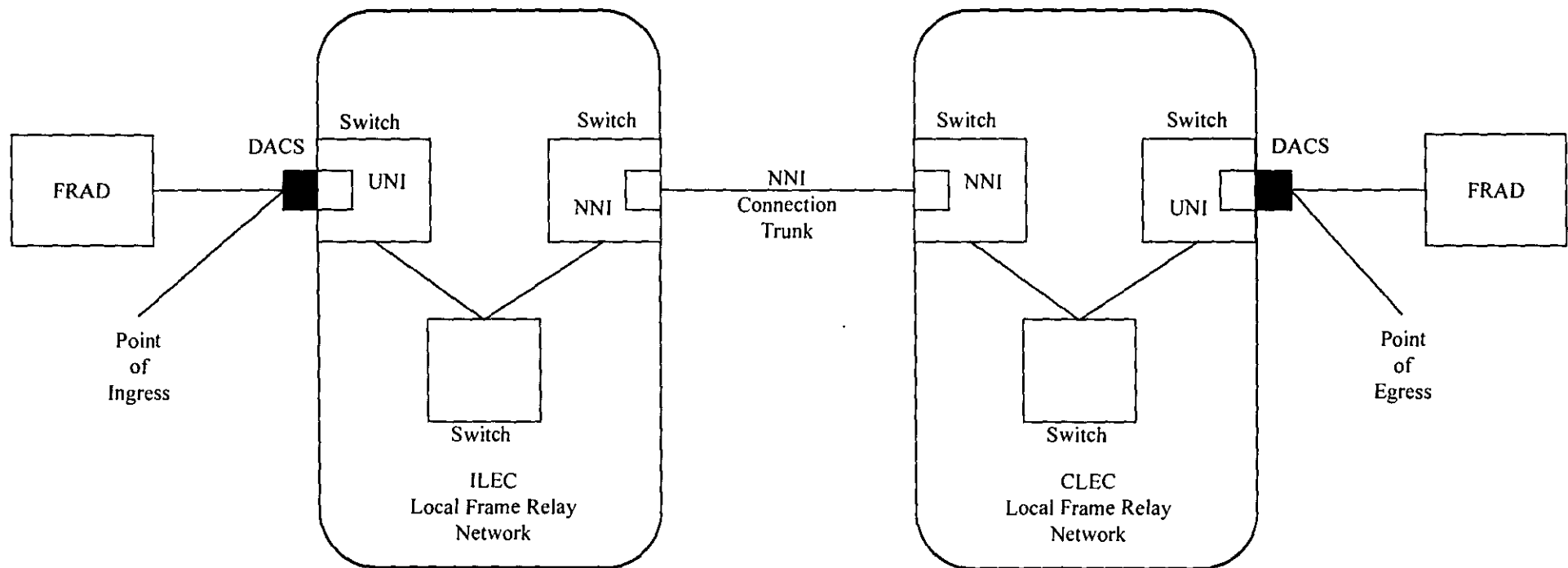
Diagram F

Frame Relay Interconnection

Local loop connection from UNI to ILEC end-user

MUX
UNI Port

ILEC Frame Relay Switch A

(PVC 4)

B

ILEC Local Frame Relay Network

C

D

LATA BOUNDARY

Inter LATA connection end-user provider via e.spire, Intermedia, or IXC transport, which may be combined with ILEC loop plant

MUX

UNI Port

e.spire Frame Relay Switch Z

Y

X

W

(PVC 1)

Q

NNI Connection

NNI Port

E

(PVC 2)

(PVC 3)

F

e.spire/Intermedia Local Frame Relay Network

T

R

S

NNI Port

LATA BOUNDARY

Local loop connection from UNI to ILEC end-user

UNI MUX
Port

(PVC 2)

U

NNI Port

V

InterLATA NNI Connection

NNI Port

L

(PVC 3)

M

UNI Port

MUX

UNI Port

MUX

Local loop connection from UNI to e.spire's end-user

Third-Party Carrier Frame Relay Switch K

Third-Party Carrier Frame Relay Network

N

Local loop connection from UNI to Third-Party end-user

DC01/86064.PPT

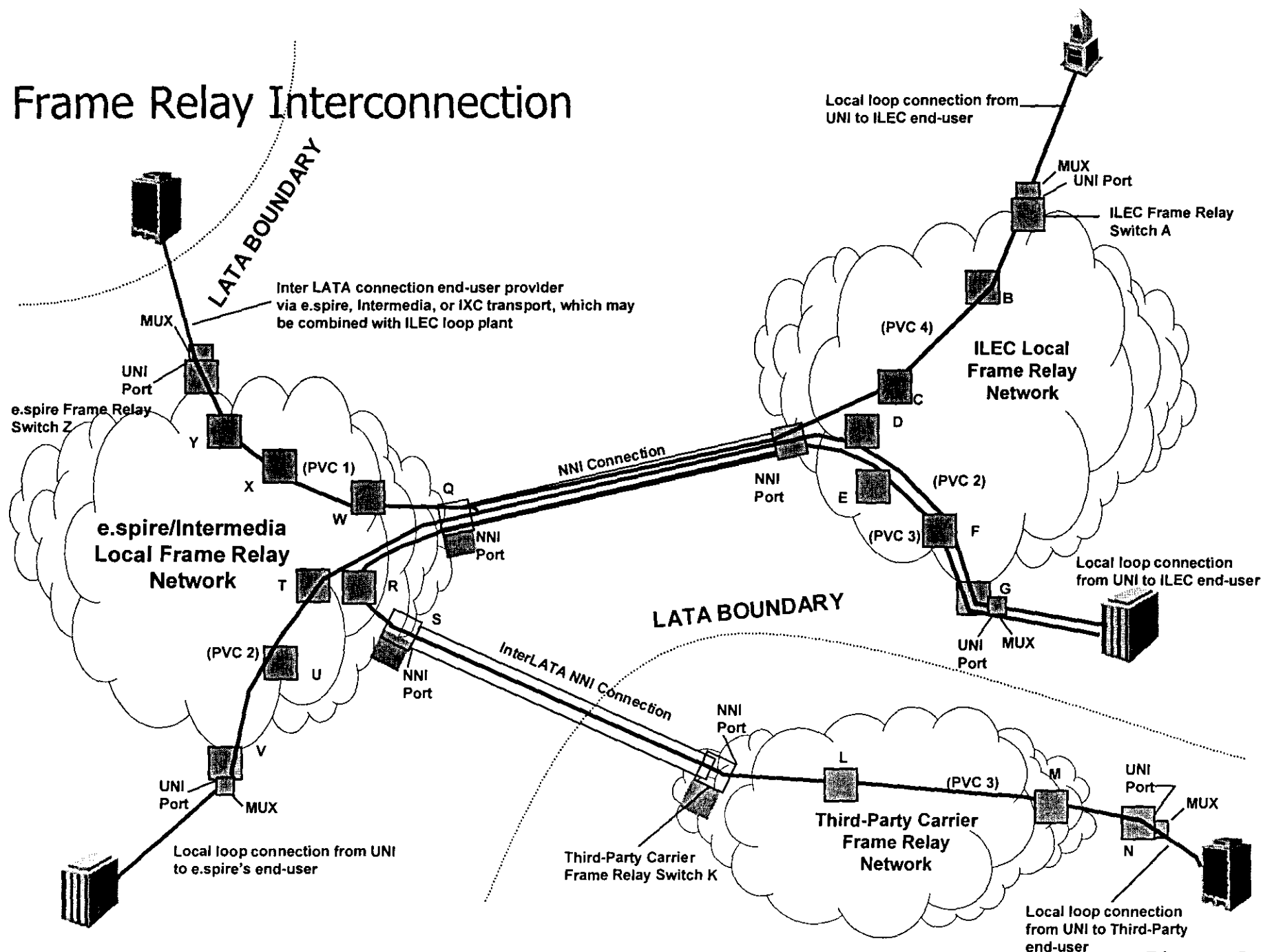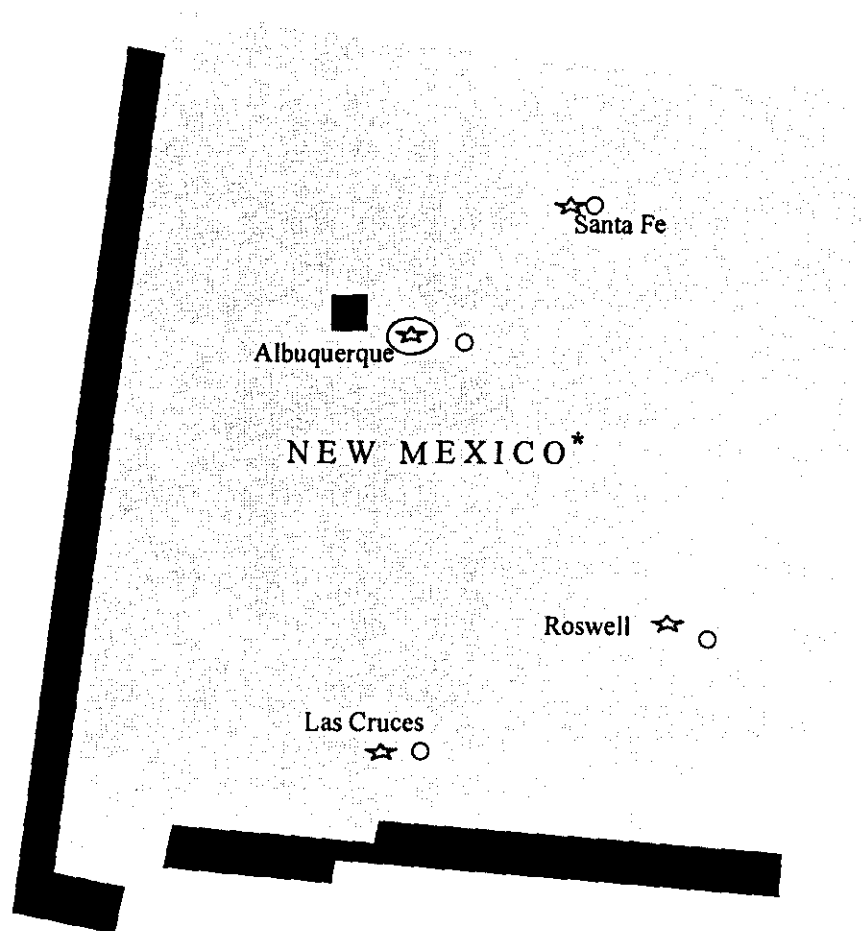Diagram G

# How to get a frame relay customer onto a CLEC's frame relay network

For the customer's headquarters location, the connection is simply made by bringing the customer "on-net" (self-provisioning a loop) or by leasing a local loop UNE.

For the customer's LANs in outlying locations, a CLEC, in this case, e.spire, should be able to choose between circuit-switched delivery or packet-switched delivery via ILEC UNEs. As demonstrated on the next diagram, each method presents several costing scenarios which factor directly into e.spire's ability to provide competitive frame relay services.

☆   Frame relay customer LAN (⊛ Headquarters)

■   CLEC frame relay POP/switch

○   ILEC frame relay POP/switch

*   New Mexico is a single LATA state

Diagram H
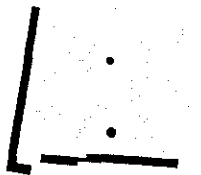
Different delivery options lead to different pricing scenarios
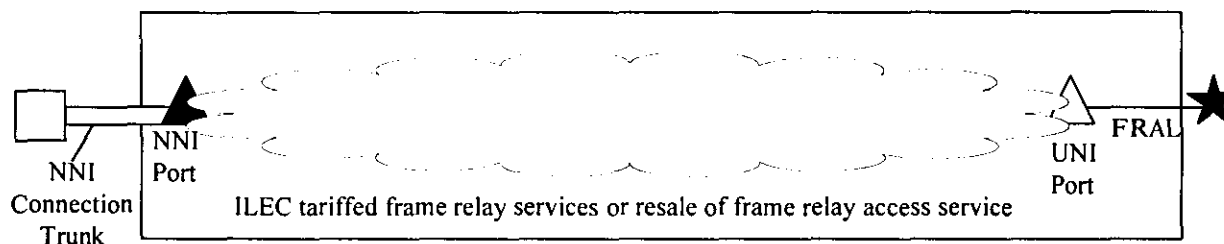
Pricing

e.spire frame relay switch/POP Albuquerque

Customer LAN
Las Cruces

May be efficient, if transport link is short. Prohibitively expensive in most cases where UNE combinations or extended link are not available. Even then, costs may not be comparable to the TELRIC of packet-switched transport.

Long-haul dedicated transport line   Loop UNE

Collocation at ILEC end office or UNE combination or extended link UNE
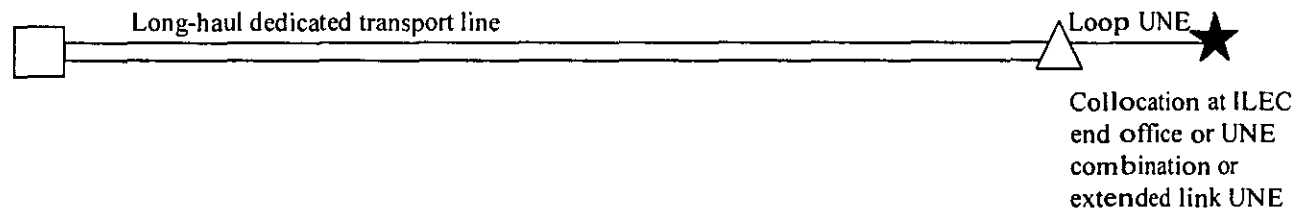
Tariffed rates are unrelated to cost - do not reflect efficiencies of frame relay networks. Resale costs roughly 30-40% more than UNEs.

NNI Port
NNI Connection Trunk
ILEC tariffed frame relay services or resale of frame relay access service
FRAL
UNI Port

TELRIC pricing of ILEC rate elements reflects efficiencies of ILEC network.

NNI Port
NNI Connection Trunk
UNI, NNI and DLCI@CIR UNEs (based on ILEC tariffed frame relay rate elements) or PVC UNE (encompassing ILEC tariffed frame relay rate elements)
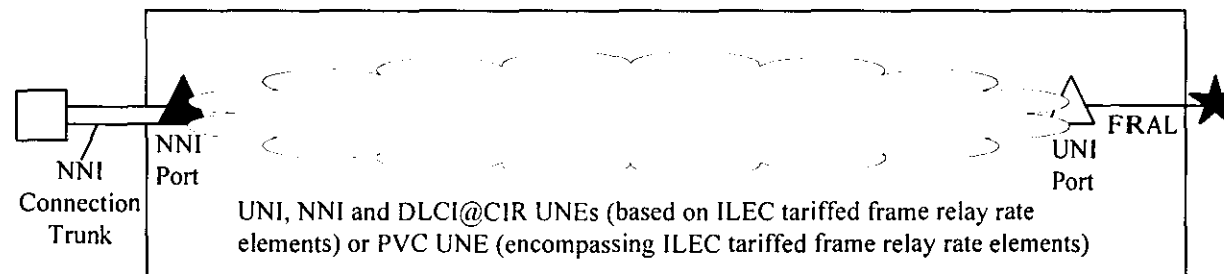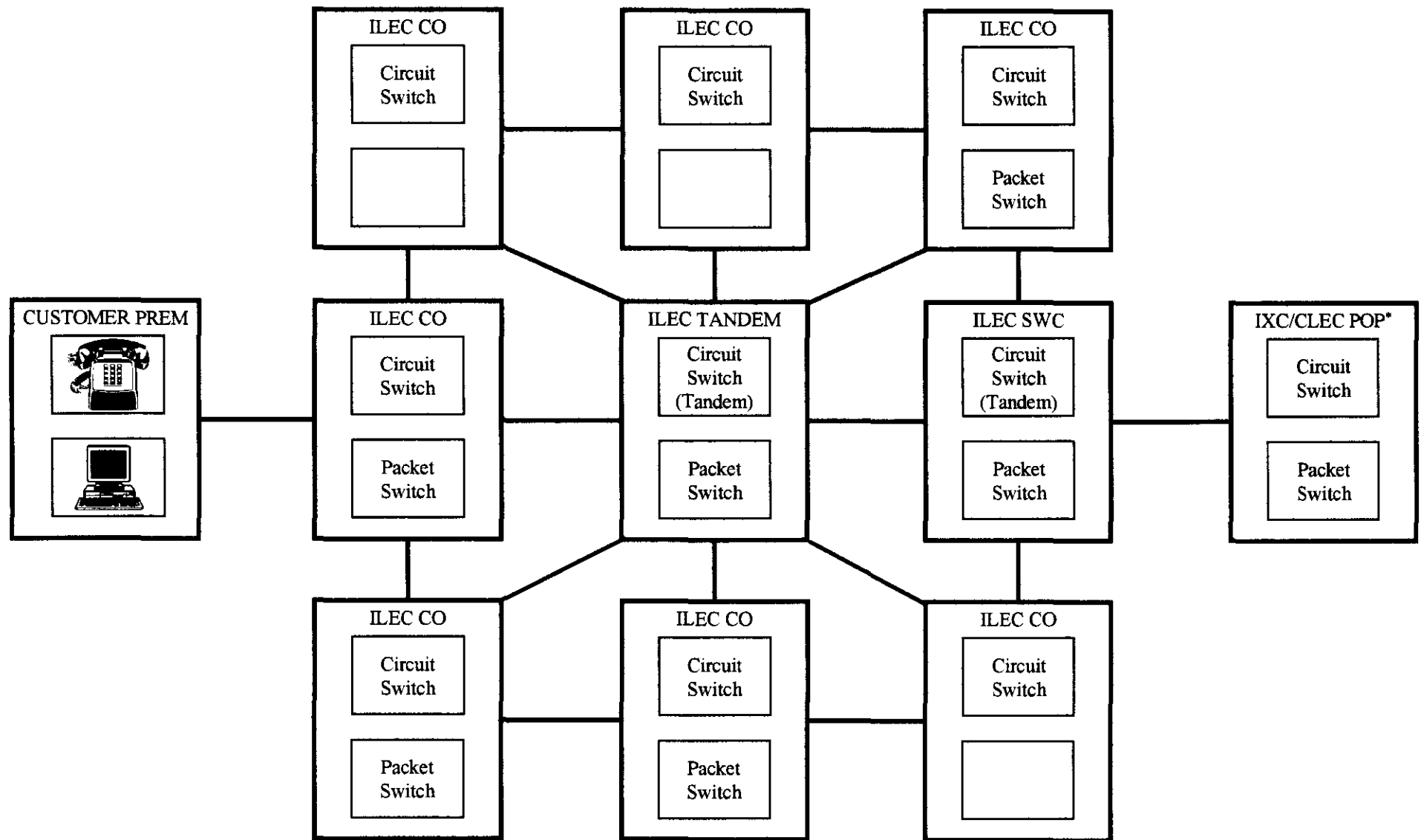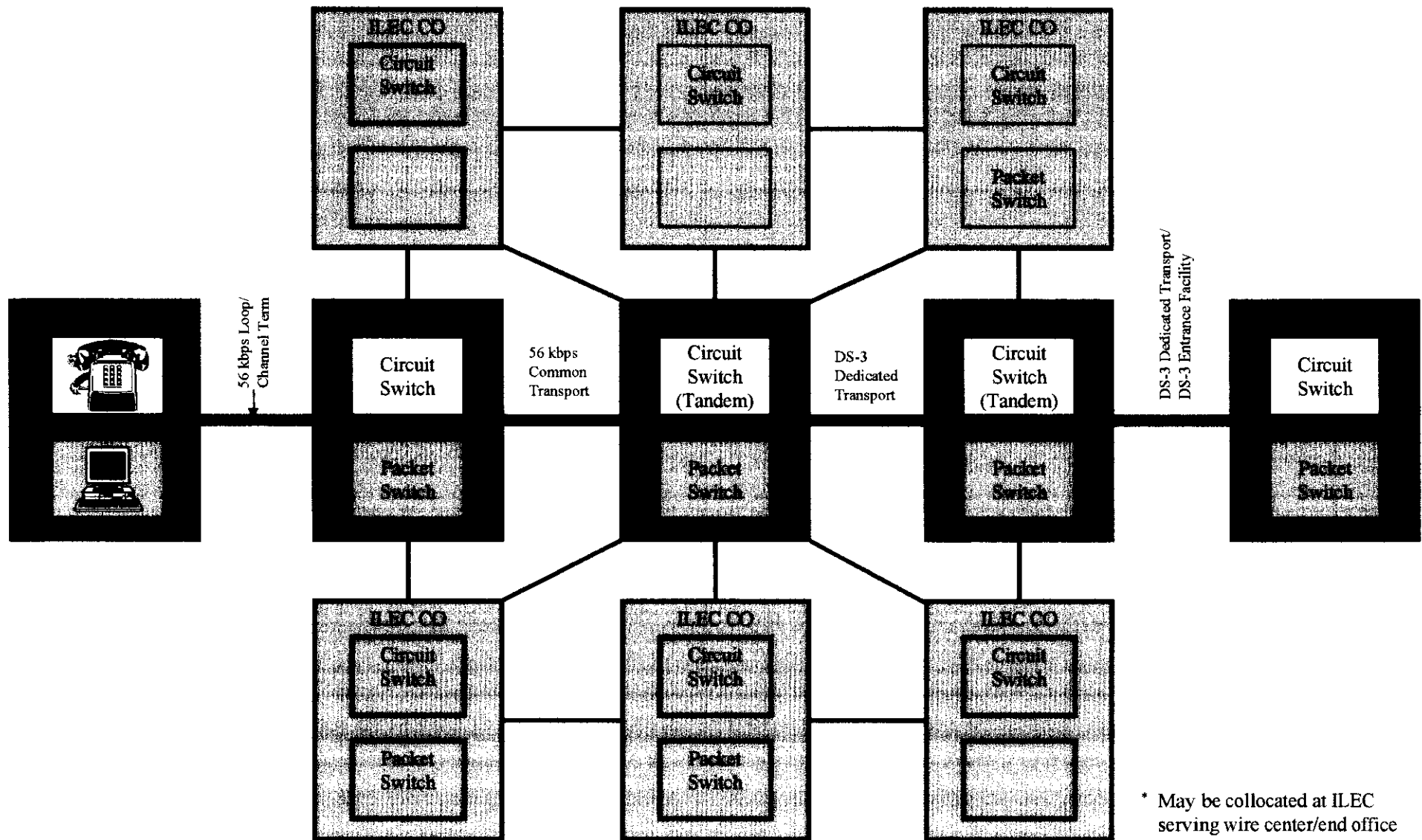FRAL
UNI Port

Diagram I

The Integrated ILEC Network

DC-88645.ppt

* May be collocated at ILEC
serving wire center/end office
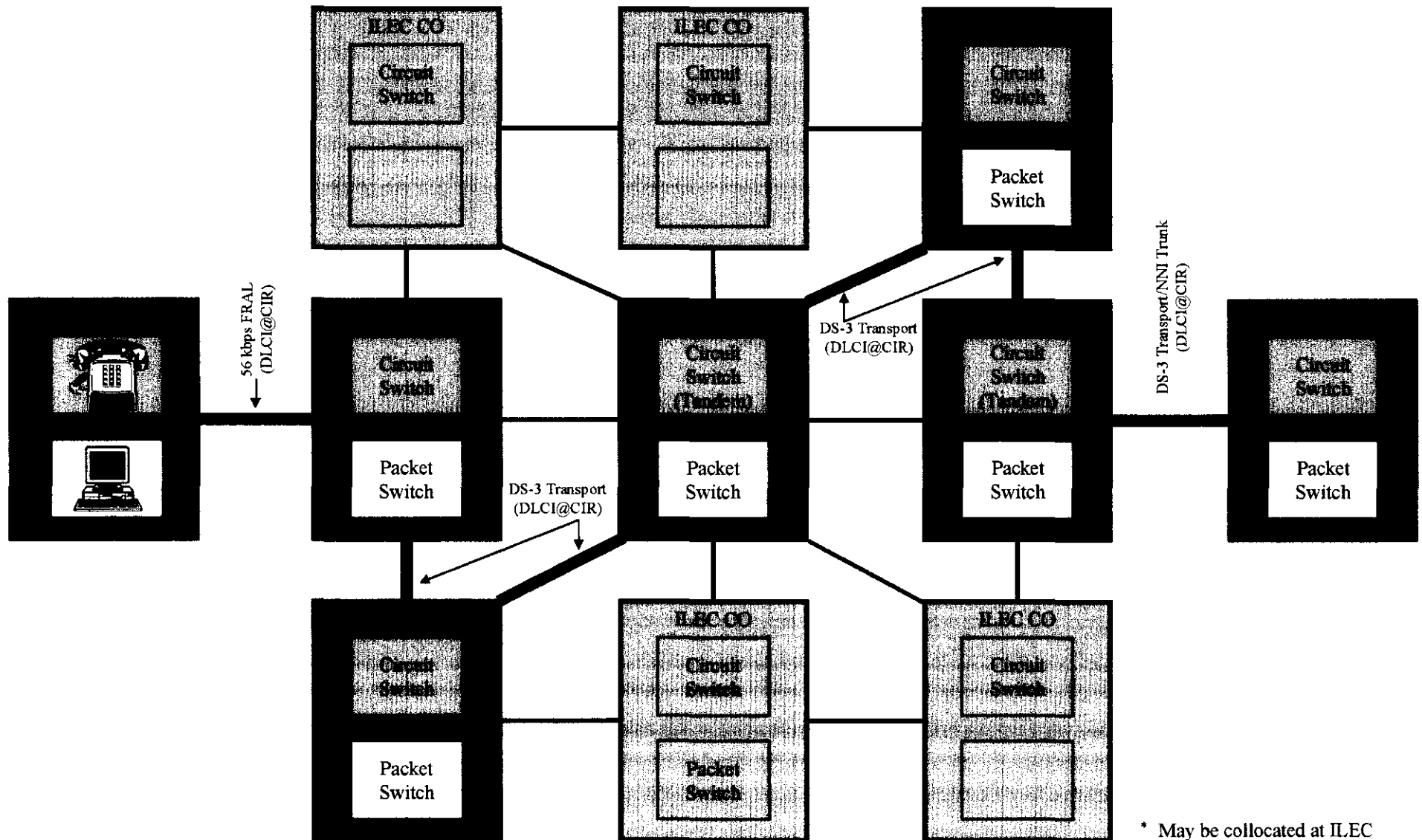
The Integrated ILEC Network

Circuit-Switched Special Access

* May be collocated at ILEC
serving wire center/end office

DC-88645.ppt

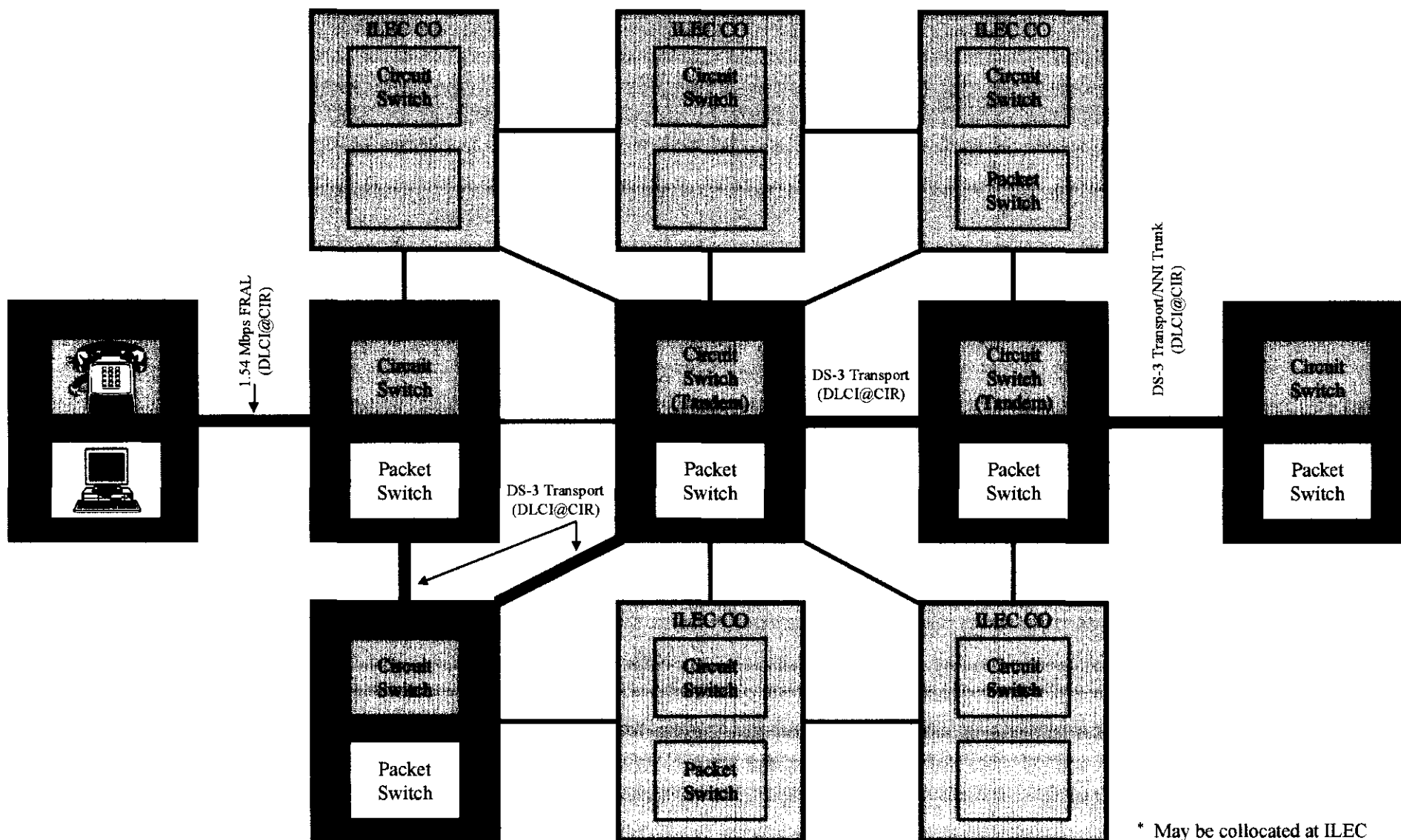# The Integrated ILEC Network

■ Packet-Switched PVC (1)

* May be collocated at ILEC
  serving wire center/end office

DC-88645.ppt

The Integrated ILEC Network

Packet-Switched PVC (2)

ILEC CO

Circuit Switch

ILEC CO

Circuit Switch

ILEC CO

Circuit Switch

Packet Switch

1.54 Mbps FRAL (DLCI@CIR)

DS-3 Transport/NNI Trunk (DLCI@CIR)

Circuit Switch

Packet Switch

Circuit Switch (Tandem)

DS-3 Transport (DLCI@CIR)

Circuit Switch (Tandem)

DS-3 Transport/NNI Trunk (DLCI@CIR)

Circuit Switch

Packet Switch

Packet Switch

DS-3 Transport (DLCI@CIR)

Packet Switch

Packet Switch

Circuit Switch

Packet Switch

ILEC CO

Circuit Switch

Packet Switch

ILEC CO

Circuit Switch

* May be collocated at ILEC serving wire center/end office

DC-88645.ppt